

Fun and Games... In the Classroom?

MaryFran Desrochers, Gretchen Hein, Mary Raber, Debra Wright

**Michigan Technological University
(School of Technology/Department of Engineering Fundamentals/College of
Engineering/Department of Biomedical Engineering)
1400 Townsend Dr.
Houghton, MI 49931**

Abstract

Active learning techniques have been shown to improve student interest in and learning of course materials. New educators, however, can find it challenging to incorporate active learning experiences into their courses. This paper will discuss the use of games, from simple icebreaker exercises to more complex learning activities, as active learning experiences in the classroom. Examples for small and large classrooms will be presented, as well as some of the challenges in incorporating these exercises into the curriculum.

Introduction

When did learning stop being fun? Children show an innate curiosity to the world around them. Everyday is a fun learning experience as children discover how the world around them works. Somewhere between childhood and college the idea that learning is fun is lost, with most college courses focusing solely on content while neglecting enjoyment. There is a certain amount of information that does need to be conveyed and traditional lectures may work well for this. However, varying the way that information is presented helps to keep the students and the faculty engaged in the learning process. Day after day of traditional lectures can make it difficult for the students to digest all the material and make instructors feel like they are just relaying information instead of teaching.

Neglecting fun in the classroom can be a mistake. Fun and games can help the classroom in three main ways:

1. Address the needs of individual and varied learning styles of students,
2. Encourage students to actively participate in learning,
3. Reinforce concepts through repetition in unique ways.

First, students each have their own learning style, and learn in vastly different ways. Some students prefer a reflective approach to learning, while others prefer to debate and discuss new concepts. Games introduce an active and fun component to class, which helps to engage active learners. By

changing our teaching styles¹, we engage all learners in our classroom and address the learning needs of different students. Trying new things in the classroom also helps instructors to feel challenged and energized.

Secondly, studies have shown that students learn more by being active participants in the subject material²⁻⁷. Retention of knowledge and interest in the subject material are enhanced, and students master higher level thinking skills relative to traditional lectures⁷. Studies have shown that active learning of material leads to 90% retention of the subject matter, while less than 30% is retained when the material is only heard or seen⁸. Students' attention spans are also limited to ten minutes of passive learning⁹. There are many examples of the success of active techniques. Hands-on activities in a physics classroom increased student performance on standardized exams by two standard deviations when compared to students in traditional courses¹⁰. In another classroom, students were formed into groups and asked to solve a murder¹¹. Faculty served the role of witnesses and experts, while students discovered and learned the traditional concepts of the course in a discovery based environment. While some students found the unstructured nature of the course distracting, most students enjoyed the experience and greater participation and attendance was noted by the instructors.

Thirdly, students learn concepts better when introduced to them in different ways¹². Repetition helps to reinforce concepts, while the variety supports the different learning styles seen in students. In one example¹², students were introduced to a new concept in five different activities. Some activities involved quiet reflection, while others involved debates or lectures. In the authors' experience, the concepts were more thoroughly learned, and the class was more enjoyable for the students.

While fun and games in the classroom may seem like an oxymoron, an examination of educational research suggests that these activities may be one way to increase student learning and retention. Particularly for new educators, however, challenges abound when implementing these new techniques in the classroom. Students who are unwilling to participate or who are skeptical about the benefits of active learning can sabotage the positive effects of the activity¹³. Also, when using humor and fun in the classroom, care needs to be taken so that students aren't insulted or offended^{14,15}. The goal of this paper is to introduce fun activities used by the authors in their classrooms or found in the literature, describe the learning benefits from each and alert the new educator to some of the challenges encountered in implementing these activities in the classroom. As with any change in the classroom nothing is perfect the first time¹⁶. It is important to let your students know that active learning will be used and what you are expecting from them¹⁷. We have found that the students appreciate the change from the norm and are willing to offer suggestions to improve activities¹⁸.

Classroom Activities

Get their attention, wake them up!

Some days, it is a challenge just to get students to participate and be engaged in the classroom. When we grab the students' attention we can set the tone for a lively and fun class which will help to get everyone excited about the topic of the day¹⁸. Here are some ideas to use anytime during the class session or throughout the term to try and liven things up.

§ Talk with your students

Arrive a few minutes before your class starts and engage the students in conversation. Find a

topic that sparks interest, such as current political, national or local happenings, current university “scandals”, a television show from the previous evening, new movies or sporting events. Taking a few minutes before class to talk informally with the students shows that we are “human” and helps to put the students at ease¹⁸. This works well for small to medium class rooms, in a large lecture hall it is hard to get everyone involved in the discussion.

§ *Inject humor in lecture*

Make silly jokes in class when it is possible and appropriate. Whenever we can laugh with each other and at science, it makes coming to class more fun. Also laugh at yourself when you make a mistake¹⁸. Humor is a wonderful tool, just be careful not to offend your class and be prepared for the class not to think you are as funny as *you* think you are.

§ *Chocolate as the great motivator (or quiz or homework points)*

Occasionally bring pieces of candy into the classroom. Encourage students to ask or answer questions. If the student participates they are rewarded with a piece of candy or a few homework points. They do not have to be correct. This encourages the students to talk in class. A drawback is that it can be costly over a term, so use it wisely. You’ll be amazed what students will do for one homework point or piece of candy.

§ *Famous quotes*

At the start of the lecture put a quote up for the class, but leave the author blank. The first person to find the author is given a few homework or quiz points.

“Do or do not. There is no try.” – Yoda to Luke Skywalker in the Empire Strikes Back

“The truth of the matter is that you always know the right thing to do. The hard part is doing it.” – General H. Norman Schwarzkopf

§ *Comic strips*

Another great way to start or end a lecture is to put up a comic strip for the class to view.

Frank & Ernest

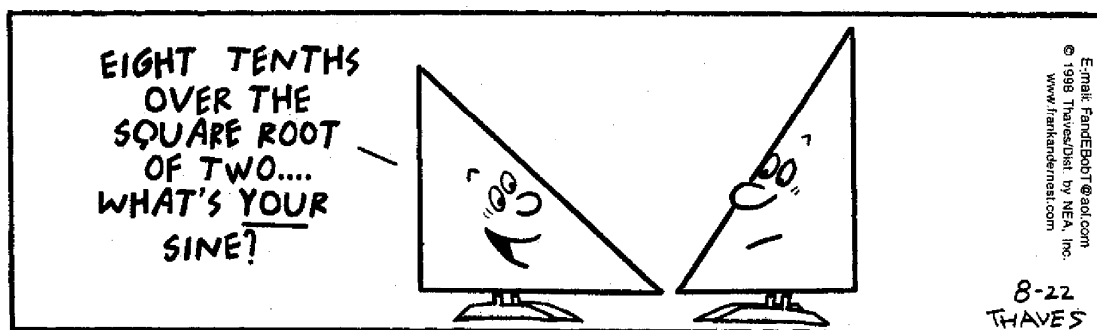


Figure 1. Comic Strip Example

▪ *Riddles*

At the start or end of class present the students with a riddle. The first student with a correct solution can be awarded a few homework or quiz points. One drawback is that they might spend too much time on the riddle and not on the lecture for the day. However, it is better to have minds working than minds drifting.

Given a 3 gallon jug and a 5 gallon jug and an unlimited supply of water, how do you get 4 gallons?

(Fill the 5 gallon jug. Pour 3 gallons into the 3 gallon jug. Dump out the 3 gallon jug. Pour the remaining 2 gallons from the 5 gallon jug into the 3 gallon jug. Fill the 5 gallon jug. Pour one gallon off into the 3 gallon jug. 4 gallons remain in the 5 gallon jug.)

§ *Logic puzzles*

Pass out logic puzzles for the students to solve. At first glance the students will just feel that they are just solving the puzzle, but you can explain how it helps to illustrate learning theory. The subject matter may not relate to course material, but learning how to take the inputs, organize the facts and come up with a solution applies to all engineering or technology curriculum. Since the puzzles are not related to the topic material, there is less intimidation to participate¹⁹.

Getting off to a good start!

Set the tone on the first day of class. If the students know that you expect them to actively participate from the beginning, they will know what to expect later on. This will help avoid resistance to change later in the term. We suggest starting the first day of class with some sort of icebreaker game. It is also very helpful if the students get to know one another and feel connected to each other. Fun and games can also help students to know each other and the instructor better, which helps in the educational process²⁰.

§ *The name game*

This works great for smaller classes (or break a large class into groups). Have the students in a circle or line. The first student gives their name, the next student repeats the name and then adds their own. This continues all the way around until you reach the first student. The instructor should be at the end⁹.

§ *Two truths and a lie*

This works well for small to medium classes. The instructor starts by standing up in front of the class stating two truths about themselves and one lie. It is the students' job to determine which statement is the lie. Each person in the class then takes a turn.

§ *People search*

This works well for small groups. Students receive a sheet of paper with five to ten statements on it and a space for a signature. An example is, "Someone who knows the order of the planets". The students are given 10 minutes to get as many signatures as possible⁹.

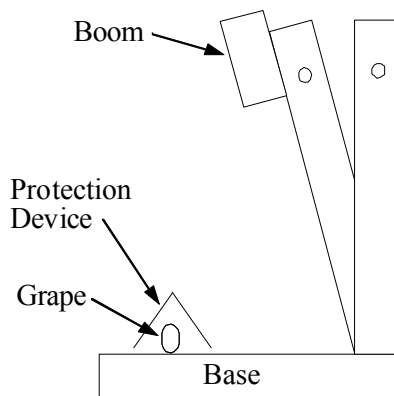
§ *Famous structures*

On the first day of class each student was given an index card with the name of a famous structure (Eiffel Tower, Hoover Dam, etc.) written on it. The card was then taped to their back. They did not see the name of the structure. They were allowed to ask each student in the room one question about their structure, until they were able to figure out their structure. Each student was then responsible for researching that structure and giving a five minute presentation on it later in the semester. This was done for a statics course, but could be modified for other types of courses.

§ *Tower 'O Cards*

This is used as a team icebreaker and is revisited later in the semester when students are introduced to engineering design²¹. In this activity, each team is given 100 3" x 5" index cards, staples and a stapler. The challenge is to build the tallest tower using just these materials that will support the weight of a designated textbook. They have approximately 15 minutes to construct their tower. At the end of this period, each team brings their tower to the front of the classroom and loads the textbook on the tower. If the tower does not collapse, the height of the tower is measured. The "Tower 'O Cards" is revisited about eight weeks later. In this activity, each team writes assembly instructions for their tower design. These instructions are given to another team to build. The instructions must fit on one sheet of 8 1/2" x 11" paper and can include sketches. The teams are given 15 minutes to construct a tower of cards using 100 3" x 5" index cards, staples and a stapler using the instructions they received. The challenge is to interpret the drawings and written instructions. In many cases, the towers do not look anything like what the authors intended because either the instructions or the sketches were unclear. Several teams become frustrated with the instructions they receive and end up with either very short towers or no tower. During this phase, the teams learn the importance of communication. At the end of the construction period, the towers are tested by loading them with a given textbook. The heights are once again recorded. The teams who wrote the instructions are surprised by what the other built using their instructions.

§ Grape smasher



Student teams are given a 3" x 5" sheet of paper and a toothpick. Their assignment is to design a device in 5- 10 minutes that will prevent a grape from being smashed by the grape smasher boom shown in Figure 2. First, the grape is placed on the base. Then, the students place their protection device around the grape. Finally, the boom is released and the fun begins! The students are extremely involved during the testing phase. They enjoy when an innovative design succeeds or when a grape is demolished during testing. After the testing phase, a class discussion is held regarding what worked with the designs and what did not.

Team Building

Michigan Technological University's (MTU) Team Effectiveness Challenge Course (TECH) was initiated in the spring of 1996 to address a need for improved leadership and team building

opportunities for students. The challenge course, sometimes known as the ropes course, was permanently constructed on campus as a mechanism to enhance and develop teamwork, leadership skills and communication. To date, thousands of participants have experienced this outdoor adventure experience at MTU.

Adventure education relies on a combination of fun, physical risk, and mental challenge to create an atmosphere for personal and group development. It is a method of guiding individuals and groups to new heights of self-awareness and understanding. It involves play, risk, tension, fear and compassion. It is an honest form of learning meaning that participants are not tricked into learning - the leader/facilitator does not provide all the answers - primarily the participants learn from each other^{22,23}.

The learning goals of the TECH course include increasing mutual support within a group, developing abilities that contribute to group decision-making and leadership, fostering appreciation and respect for differences existing within a group, and appreciating the interdisciplinary nature of real problem solving. Many engineering and business courses at MTU have incorporated the use of the TECH as a way to facilitate the development of these abilities.

A typical 2-4 hour session would bring together groups of 10-30 people who have identified specific team goals they would like to address. The session is then tailor-fit to help address these goals. Such a session would likely include 1-2 warm-up activities, 3-4 problem-solving activities and a debriefing session whereby students are prompted to reflect on their experience and how it relates to the issues they are/or might encounter in their team-related projects in the classroom.

§ *Warm-ups - Intended to de-inhibitize the group and facilitate getting to know each other:*

- *Circle the Circle* - Have the group form a hand-in-hand circle. Place two large hoops together between two people (resting on their grasped hands). See how quickly the participants in the circle can cause the hoops to travel around the circle (over the people) in opposite directions, with the hoops moving through each other, and back to the originating point.
- *Group Juggle* - Have the group form a circle. Using one ball, pass it to each of the members in a random fashion until everyone has had the ball once. Have the ball come back to you in the end. They then have to throw it around the circle, in the same pattern, remembering who they threw it to and whom they receive it from. When they have mastered the pattern with one ball, add another, then a third, fourth and so on. See how many balls are in place before errors start occurring.

§ *Initiatives - Intended to develop group problem-solving, decision-making, communication, teamwork:*

- *Toxic Waste* - requires a group to transfer the contents of a portable bucket of balls (toxic waste) into a fixed empty container without dropping any balls and without entering or touching the marked-off circular space in which the containers sit. Group can only use a selection of varied length ropes to accomplish the task.
- *Stepping Stones* - requires a group, using small portable squares or rectangles, to

traverse a designated area moving around a few obstacles without stepping off the squares. Give the group 1-2 less squares than the number of people in the group. Squares will be taken away if they lose contact with them. Group members are also required to stay connected in some way at all times.

- *The Spider's Web* - Requires a group to move all its members through a 6-8 foot high vertical spider's web without touching any of the ropes used to form the web. The web is typically constructed using a variety of length ropes tied together between two poles or trees in a web-like pattern. Group members can only pass through an opening once, but each opening may be used twice.

§ *Typical Debrief Questions:*

- What happened?
- What did you learn?
- How does this relate to what we are studying in class?
- How pleased were you with your group's performance?
- What emotions did you experience?
- What things did your group do particularly well?
- Where could your group improve?
- What would you do different next time?

Introduce New Concepts

Introducing new subject matter can be daunting. The concepts may be difficult and unfamiliar to the students. By generating interest at the start with a fun activity, students may be more interested in the work that follows.

§ *Brainstorming*

Students generate ideas on a topic, and the team with the most ideas “wins.” Sometimes, candy or bonus points are given as “prizes.” The goal of this activity is different depending on the topic. In some cases, it will stimulate creativity (How can I approach this problem?). In other cases, it serves as a mini-review from a pre-requisite course or previously covered topic (What do you remember about this topic?). Some students are reluctant to participate, but most like talking in groups. The group appoints a spokesperson that will present initial responses from the group until the entire classroom is excited to participate¹.

§ *Videos*

Sometimes a picture is worth a thousand words. A short video illustrating a new concept can be useful and a change of pace in the classroom.

▪ *“Slime”*

To illustrate physical concepts, a demonstration is often helpful. For example, students making “slime” – a combination of glue, water and borax, can show the concept of a lightly cross-linked polymer. Students have fun playing with it, and discover properties of polymers on their own. It serves as a good icebreaker in the beginning of the course as students are mixing their slime, and it seems silly, so they enjoy the activity. Throughout the semester, it serves as a reference point to concepts that are introduced later.

Review Concepts

Summing concepts up at the end of the semester can be a one-sided question-and-answer session or a fun activity geared to generate questions and participation from students.

§ *Games*

Playing games that everyone is familiar with can help energize the review process. Who wants to be a millionaire?²⁴, or Jeopardy⁹ work well, or you can have the students make their own board game^{9,25}. The students can submit questions to be used for the games. While playing the games, the students rely on each other to find the answers. This reinforces concepts learned and encourages teamwork and group-reliance.

§ *Matching cards*

Questions are written on colored index cards, and answers on white cards. The cards are shuffled and are all distributed to the students. Each student will have multiple question and answer cards, depending on the size of the class and number of questions. Each student searches for the matches to their cards. After all the cards are matched, the instructor reviews the questions, with students asking additional questions. It serves to generate questions on topics that students may not have studied, or refresh concepts, and as an icebreaker²⁶. This can be used as a review exercise at the start or end of the term.

Summary

Introducing games in the classroom can be daunting, but the benefits to your instruction and students' learning makes it worthwhile. It takes time to find activities that are suitable for your subject matter and students. Don't be discouraged that every class doesn't have the same level of fun and games – take it one class at a time. Start by trying one activity the next time you need a change of pace in class and watch the fun and learning begin!

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Biographical Information

MARYFRAN DESROCHERS is an Assistant Professor in Mechanical Engineering Technology at

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MTU. She earned her BSME from MTU and her MS in Applied Science from the University of Arkansas at Little Rock. Prior to pursuing her MS degree, she worked as an engineer for Kimberly-Clark Corporation. She teaches Machine Design, Instrumentation and advises senior projects.

GRETCHEN HEIN is a lecturer in the Department of Engineering Fundamentals at MTU where she also earned her Ph.D. She earned her BSME at Kettering University and her MSE at Purdue University. Prior to pursuing her MS degree, she worked as an engineer at General Motors Corporation. She teaches Fundamentals of Engineering I and II, and Engineering Applications in Science and Precalculus.

MARY RABER is the Industrial Projects Coordinator in the College of Engineering at MTU. Her responsibilities include coordination of university and industrial interaction, Enterprise Program coordination and module delivery. She earned her BSME from the University of Michigan and an MBA from Wayne State University. Before joining MTU she held various engineering and management positions at Chrysler Corporation and TRW.

DEBRA WRIGHT is an Assistant Professor in the Department of Biomedical Engineering at MTU. She earned a BSME from MTU and an M.S. and Ph.D. from Northwestern University in Biomedical Engineering. She teaches Human Biomechanics, Advanced Polymeric Biomaterials and advises senior design projects. Her research interests are in designing and characterizing new biomaterials for orthopedic applications.